VCU

Virginia Commonwealth University

James River CHLa Study
Report on Third Meeting of Science Advisory Panel
May 3, 2012
Virginia Institute of Marine Sciences

Agenda

10:00 am	Opening Remarks by Paul Bukaveckas
10:15	Update on 2011 Algal Blooms (P. Bukaveckas, Will Hunley, & Harold Marshall)
11:00	Panel Discussion of 2011 Data
11:15	2012 Data Collection in the Upper James (Paul Bukaveckas)
11:45	Panel Discussion of Upper James Data Collection
12:00	Lunch Break
1:00	2012 Data Collection in the Lower James (Margie Mulholland & Kim Reece)
1:40	Panel Discussion of Lower James Data Collection
2:00	2012 Modeling Activities (David Jasinski & Jim Fitzpatrick)
2:30	Panel Discussion of Modeling Activities
2:45	Sediment Flux Study (Ken Moore)
3:30	Panel Discussion of Sediment Flux Study
4:00	Wrap-Up & Adjourn Meeting

Paul Bukaveckas (VCU) provided an overview of the meeting agenda and Ken Moore welcomed the members of the Science Advisory Panel and guests to VIMS and the Wilson House. The purpose of the meeting was to summarize data collection activities completed in 2011 and to describe proposed data collection and modeling activities for 2012.

Presentations on 2011 data were given by Paul Bukaveckas (Upper James River), Will Hundley (HRSD, Lower James River) and Harold Marshall & Todd Edgerton (ODU, Phytoplankton Community Composition). The presentations were followed by questions and discussion among panel members. Several questions focused on the collection and interpretation of the dataflow CHLa measurements including potential issues such as phytoplankton vertical migration, use of surface water measurements to infer water column values and methods for interpolating over time and space.

Paul Bukaveckas described proposed research activities for 2012 in the Upper (tidal-fresh) James River. Subsequent panel discussion focused on the approaches to assessing “top-down” controls on algal blooms and related modeling framework. Data collection included (a) measuring grazing rates by benthic filter-feeders (Rangia), and (b) using gut contents analysis of CHLa to identify potentially important fish grazers. Jim Fitzpatrick stressed the importance of relating Rangia grazing rates to individual body size so that information on population size distribution could be incorporated in modeling these effects. Paul Bukaveckas responded that a wide range of shell sizes were obtained during sampling, and that replicate mesocosms consisted of similar-sized individuals so that body size could be evaluated as a co-variate in the analyses of these data. Ken Moore expressed concern about the utility of measuring CHLa in fish gut contents as CHLa is prone to rapid breakdown to Phaeophytin. Paul Bukaveckas agreed that CHLa

measurements in gut contents would likely represent a conservative estimate of algal contributions to their diet. Comparisons of CHLa:PHEO ratios among suspended matter, sediments and gut contents might provide some insight on pigment stability after ingestion. Paul Bukaveckas re-iterated that the gut contents analyses was a first step in identifying important grazers and that further work (Years 2 and 3) would require estimation of feeding rates and population size in order to fully incorporate these effects in the deterministic CHLa model. Further studies on zooplankton grazing are not planned at this time as prior work has suggested that their ingestion of CHLa is very low in the tidal-fresh James. However, if model simulations indicated that CHLa predictions were especially sensitive to assumed zooplankton grazing rates, this issue could be re-visited in Year 2 or 3.

Margie Mulholland and Kim Reece described data collection activities in the Lower James inclusive of toxicity assays and collaborative work with HRSD to monitor the spatial and temporal dynamics of algal blooms. Harry Wang commented on the concept of "hot spots" (zones of bloom initiation) and the challenges to incorporating these into a deterministic modeling framework. It was suggested that if spores from the benthos were important for initiating blooms, and if these spores are widely dispersed, hot spots could potentially occur anywhere, but likely sites could be identified from areas with long water residence time and proximal nutrient sources (e.g., storm runoff).

David Jasinski and Jim Fitzpatrick described the overall modeling effort and specific tasks to be completed. A number of questions were addressed during the panel discussion of the modeling effort. Jim Fitzpatrick mentioned that Carbon was the unit currency of the deterministic CHLa model and therefore depended upon being able to convert between CHLa and C in modeling standing stocks as well as transformations (grazing rates, etc.). It was agreed that wherever possible, measurements of CHLa should be coupled with determinations of POC to capture spatial-temporal dynamics of C:CHLa ratios. There was also a brief discussion of the need for, and practicality of, having a centralized database containing data generated by this project. This would depend upon PI's of the individual projects submitting data in a consistent format to a central repository. Ken Moore indicated that the VECOS (Virginia Estuarine and Coastal Observing System) website performed a similar function in providing access to long-term monitoring data for the James River.

Lastly, Ken Moore provided an overview of the sediment flux study to be performed by Iris Anderson. The suggested timeline for this study was to collect data in early and late summer though Ken indicated that it would not be possible to obtain the early summer data in this calnder year. Therefore, the likely scenario was to obtain a set of measurements this August and then again at the same sites in June 2013. There was some speculation as to whether further work would be needed beyond the two planned sampling events and whether this should be done at the same set of six sites or assess variation in sediment nutrient release at additional sites.

Attending: **Panel Members**
Will Hunley
Clifton Bell
Paul Bukaveckas
Clair Buchanan
Eileen Hoffman
Kimberly Reese
Margie Mulholland
Harold Marshall
Kenneth Moore
Harry Wang

Also Attending, Affiliation
David Whitehurst, VA-DEQ
Alex Barron, VA-DEQ
Anne Schlegel, VA-DEQ
Melanie Davenport, VA-DEQ
Arthur Butt, VA-DEQ
Jian Shen, VIMS
Ellen Snyder, Altria
Chuck Frederickson, James River Assoc.
K.C. Filippino, ODU
Ryan Morse, ODU
Todd Egerton, ODU
Joe Wood, VCU
Cathy Viverette, VCU
Andrew Parker, Tetra Tech
David Parrish, VIMS